Use of current journals by Indian space technologists*

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ABSTRACT: Two latest sample issues of 485 journals subscribed to by the Indian Space Research Organisation (ISRO) Satellite Centre (ISAC) library were monitored, and 1,120 in-house uses and 4,475 lent out uses were recorded over three months from the date of their first display in the library. The paper explains the methodology followed, sample covered and various limitations of the study. Use of journals is analysed by means of frequency tables showing average use per title and average use per person. The study identified unused, least used and most used journals; compared in-house use with lent out use; and examined the use of journals belonging to differing subject groups. A frequency distribution table of use over number of users is presented and the number of titles and number of subject groups in which journals are used are analysed. Finally, attention is drawn to the moderate use of journals made by Indian space technologists, with an average of about 6 uses per issue per quarter and with relatively scare use of secondary journals.

KEYWORDS: Use studies, user studies, space technologists, use of journals, current journals, special libraries

INTRODUCTION

More bibliometric, cost-benefit, cost-effectiveness, citation, use, and other studies have been done on journals than on other types of documents in libraries. It is frequently heard that journal librarians faced severe stresses from many directions. The soaring cost of journals, the need to subscribe to important core journals by airmail (or speeded mail), the increasing importance of interdisciplinary studies and rapid growth in number of journals in some fields are some of the factors that have prompted librarians to seek more funds and foreign exchange. On the other hand, the librarians feathers are clipped by inelastic buying power or even reduction in buying power as a result of inadequate budgets and inflation. This has led journal librarians to scrutinise existing subscriptions to find out whether any unused or little used titles are being subscribed to. Methods of ranking journals by decreasing order of utility (or, more accurately, use) are devised to eliminate lesser used titles whenever a reduction in buying power occurs, as it is deemed preferable to borrow such journals from other libraries or procure reprints or copies of selected articles than to subscribe. Though most of the methods have their own limitations, use study is generally simple and straight forward.

Actual usage of course describes the present demand pattern. Further, usage, patterns help in determining optimum binding arrangements, subscription priorities and the finding of substitutes when a journal is cancelled. A simple limited synchronous use study of current journals of the ISAC library is described, and the results presented in this paper.

METHODOLOGY, SAMPLE AND LIMITATIONS

The two latest issues of almost all current journals subscribed to by the library were selected as samples as and when received during September 1983 and December 1983. Preplanned data noting sheets were stuck to them to monitor and record inhouse use and circulation/lentout use for three months from the data of first display in the library (latest issues are not allowed to circulate outside in the first week). Journals are loaned for three days with no renewal privileges. Secondary journals, loose leaf journals and some journals are not allowed to leave the library. While recording lentout use, information about users is noted for comparison of use of the journals against user characteristics. A journal issue left on a reading table is treated as one inhouse use in this study. Inhouse use of journals is recorded while replacing them on the shelves. As many as four uses a day have been recorded for a single issue of a journal. Kent's definition of use as physical selection and the act of leafing through pages is adhered to.[1] Thus, if a journal were picked up, a use is recorded. The present study, then, is biased in favour of less than actual usage as far as inhouse activity is concerned, since practical considerations stood in the way of recording every usage.

Out of 630 current journals in the library, data for 485 titles were collected by the end March of 1984. The remaining journals were made up largely of gratis newsletters, popular and semi popular journals, news journals, loose leaf journals, and items that had just been cancelled or were newly subscribed to. A few were secondary journals, journals from the areas of medicine and library science, those kept in closed access and titles for which no issues were received during the survey period. All of these have been deleted from consideration. Some titles with partial data were also excluded. However, some important titles in the above categories for which either inhouse use or lentout use alone was known were included with an appropriate note.

The present study of journals suffers from all the limitations of any typical use study. Since only two issues of a title are selected as a sample, use of the titles in general and inhouse use in particular is underrepresented. However, the data of lentout use is reasonably accurate and unambiguous. It should be added that inhouse use is very much affected by inadequate display space and congestion in the library. More than one title was held in a single compartment because of shortage of display space. Further, inhouse use and lentout use are very much interdependent as only two issues of a title were monitored for three months in this study. For example, an issue of a journal which is in continuous circulation necessarily suffers decreased inhouse use, and vice-versa.

For clarity's sake, it may be noted here that back volumes of journals were not included in the study. Hence analysis by age is omitted.

The study also faces other limitations. These have to do with: difficulties in measuring use, equating use with usefulness and excluding the use of journals obtained/sent through inter library loan; the availability of current awareness and reprographic services; age dependent factors; internal biases such as size of actual stock and external biases such as users knowledge of the stock; ratio of collection to users; changes in user population structure, the scope of journals and areas of interest of users, and lending regulations. During survey library had about 1,100 members and about 4,890 borrower tickets were in vogue and all lentout use of journals is accounted by these tickets. (The same tickets were also meant for borrowing other type of documents.)

Lastly, some of the limitations of use studies pointed out by the University of Pittsburgh's Senate Library Committee in its criticism of Kent's study are worth noting. The Committee quotes a physics faculty member about fluctuation in use as

> ... when writing a research proposal or paper the use of journals may be extraordinarily heavy for a few days. Thus, it would not surprise me to find that 90% of an individual's annual journal use occurs during a ten day period, with only 10% occurring during the remaining 350 days.[2]

Further, the Committee emphasises that biases are inherent in the use of bound journals during a library's peak attendance hours. The Committee says "... some types of journal users will shun the hours of heavier attendance and come to the library when it is poorly attended so that they can spread out the bound journals with which they are working."[3] The Committee makes clear also that methods of assessing cost and benefits differ according to type of material. It indicates that support cannot be given to the claim that

> ... the relatively infrequent use of journals such as *Nuclear Physics* makes it less beneficial to the user community than very frequently used journals such as *Nature* and *Science* ... it is not a fact that all journal uses are commensurable. There are many significantly different types of journal uses and each type should have been investigated by appropriate, possibly separate methods, and counted separately.[4]

USE OF JOURNALS

At the broad level, the use of current journals at ISAC library is found to be moderate. Nine hundred and fifty issues (i.e., two issues each of 475 journals) were used 4,475 times within the library during the quarter immediately after their arrival. Similarly, 918 issues (i.e., two issues each of 459 journals) were borrowed 1,120 times by 351 users in the first quarter. The average

inhouse use per issue per quarter is 4.71, and the average lentout use per issue per quarter is 1.22. This amounts to a total average use of 5.93 per issue per quarter. Lentout use per person per quarter per single issue of all journals studied is 1.6.[5]

Frequency distribution of total use over number of journals

It is stated in Kent's study that

> ... in order to make use of a cut-ff threshold, we must be able to identify which journals fall above that point, and which fall below. This requires knowing the number of times a title was consulted, not just whether or not a particular title was or was not consulted at least once. In view of this, it would seem that a more labor-intensive, but also more fruitful method of tracking usage must be found.[6]

Table 1 presents a frequency distribution of use over number of journals and a ranking of all journals based on use. This table helps identifying unused, least used and most used journals. It may be seen from the table that less than 10% of journals were made use of and that these account for nearly 30% of total use. It is seen also that little more than 20% of journals contributed nearly 52% of total use.

Sixty journals or 12.4% of journals at ISAC library are neither consulted within the library nor borrowed from the library in the first quarter. Naturally, the chance that these journals will be used later is very bleak. All these titles including marginally used journals (i.e., those used once or twice) whether subscribed to or obtained free of charge are strongly recommended for cancellation. However, for obvious reasons, news magazines, highly specialised journals with limited specialist users and a few secondary journals may have to be exempted from such action.

Nearly 28 journals were used more than 30 times in a three-month period. In these cases it may be worthwhile subscribing by airmail, subscribing to second copies and using strong bindings to withstand the wear and tear of constant use.

In-house use

In-house use and lentout use of ISAC library journals are considered separately in this section and the next. A frequency table of inhouse use is presented in Table II. It is seen from this table that 20% of journals accounted for more than 47% of total use and less than 48% of journals contributed to more than 82% of use. Eighty three journals or slightly more than 17% were not used at all. By including journals used once or twice during the sampling period, 106 journals or

nearly 22% of journals can be considered least used journals. Fourteen journals were used more than 30 times within the library in the period studied.

Lent-out use

Table III illustrates lentout use. Two hundred and eleven journals or 43.5% of journals were never borrowed in their first three months. It is not possible to use the number of lentout use alone as a criterion for subscription or cancellation of journals since many journals are used for current awareness purposes within the library and quite a few journals carrying current news and brief communications may not be worth taking out of the library. Further, borrowing of journals is very much affected by free and adequate reprographic services in the library. Interestingly, out of these 211 journals, about 128 journals are used within the library and not literally borrowed at all (compare Tables II and III). Table III reveals that 10% of journals represent 20% of total borrowings and 19.5% of journals account for nearly 60% of lentout use.

Diagram I shows the course of inhouse use, lentout use and total use compared with the number of journals. Here the cumulative percentage of journals is plotted against the cumulative percentage of use. As the lentout use curve is much flatter than the other two it is clear that a much smaller percentage of journals are borrowed than the percentage consulted within the library. In other words, inhouse use of current journals is much higher than lentout use.

Use of journals in different subject groups

The subject use of journals is depicted in Table IV. In this table, percentage of use is presented against percentages of journals and users. Abstracting and indexing journals are not normally allowed out of the library. Total use and average use per title in this group should be viewed with this limitation in mind. Even so, it is apparent that abstracting and indexing journals are less used than might have been expected.

Areas such as computer science (Q), electronics (T) and aeronautics, astronautics and space flight (S) are better represented in the collection than are other subjects. It is in these subject groups that use is at is maximum point.

Other factors aside, usage depends on size of the collection and number of users interested in a particular subject. It may be noted in this connection that a high majority of users have physics (9%) or electronics (46%) or mechanical engineering (33%) as their broad specialisation. The number of users of each subject groups of journals shown in the table is based on actual usage and roughly indicates the area of interest/work of these users and not the specialisation.

It may be seen from the table that the percentage of total use is lower than the percentage of journals in the case of mathematics and statistics (C), astronomy and astrophysics (D), material science (G), structural engineering (K), energy and power systems (N) computer science (T), management (U) and the miscellaneous category "others" (V). All these groups except T and U have a much lower percentage of users, and so a lower use rate is not unexpected. However, the total use of journals in T and U is not commensurate with the size of the collection and the number of users, although these subject areas showed highest usage in the absolute figures. In science (B), mechanical engineering (O) and aeronautics, astronautics, and space flight (S) percentage of lent out use is higher than percentage of inhouse use. On the other hand, mathematics and statistics (C), astronomy and astrophysics (D) and Physics (E) show relatively more in-house use than lentout use. Journals in all other groups have more or less the same rate of in-house and lent out use.

"A better indication of the efficiency in the acquisition policy for each library can be gleaned from consideration of the average number of uses per title in the collection."[7] Thus, the average number of uses per title/journal per quarter per two issues is also shown in Table IV. [8] The average number of uses per journal is very high in the case of science (B), physics (E), electronics (Q) and aeronautics, astronautics and space flight (S). As mentioned earlier, the lowest average use is recorded by abstract and index journals (5.5), followed by energy and power systems (7.1), mathematics and statistics (7.4) and quality and reliability engineering (7.4). All other groups have moderate and high average use per title.

Frequency distribution of lent-out use over number of users

Lentout use alone is analysed in this section with respect to users. The ISAC library was serving about 1,100 members at the time of conducting the use study. Of these about 800 was technical staff of the centre, including scientists and engineers. As mentioned earlier, only 351 users borrowed journals during the same study period. In other words, more than half of ISAC library members did not borrow sample journals during the quarter. [9] Table V presents a frequency distribution of lentout use over number of users. Nearly 44% of these users borrowed only once. About 10% were responsible for 38% of total lentout use, and 38% have made 74% of total borrowings of journals. The frequency distribution data in Table V together with frequency distribution of lentout use of all issues and volumes of journals during a quarter are plotted against number of users in Diagram II. The lentout use of all journal issues during a quarter depicts a smoother curve than lentout use of sample issues. By and large, the distribution appears to be parabolic or asymptotic or zipfian type.

Table VI shows how many different journals/titles are regularly borrowed (i.e., used) by ISAC library users. This frequency distribution indicates the range of titles on which users depend. It is obvious from the table that more than half of the users borrow issues of a single journal/title in the area of their interest. Nearly 22% of users borrow issues of two journals/titles, and 10% borrow issues of three journals/titles. Quite a few users (i.e., 15.5%) borrow issues of 4 to 10 journals/titles regularly. Issues of 11 or more journals/titles are borrowed by 6 users.

Considering the use of current journals from the angle of users, one might be curious to know the number of different subject groups in which users borrow journals. It may be noted here that space science and satellite technology are heterogeneous, multidisciplinary areas. The frequency Table VII gives the number of subject groups in which ISAC library users are interested. More than 60% of users use journals from a single subject group. Nearly 24% use journals from two subject groups. Seven and 6 percent of users respectively depend on journals from 3 to 4 subject groups. The remaining 12 (3%) users depend on 4 to 10 different subject groups, as shown in the Table for their journal literature.

Three other informal observations may be made. By and large, journals of a highly theoretical nature and those in highly specialised subjects are less used. Among journals of the same subject group, American journals are more used than journals from Great Britain and other countries. Thirdly, users who make more intensive/frequent use of journals by and large make use of more journals from more subject groups than other users.

CONCLUSION

This use study has enabled the library to take note of unused, least used and most used journals. The overall use of ISAC library is found to be moderate, with 5.93 average uses per issue for the first quarter. The lentout use per person per quarter per one issue of all journals covered is 1.6. Nearly 20% of journals met 52% of total use and 10% met 30% of total use. Sixty (12.4%) journals were never used during the first quarter following their arrival and hence are recommended for cancellation. One hundred and twenty eight journals were used once or more within the library during the sample study, but never borrowed formally in that three month period. In other words, lentout use is catered to by a much smaller part of journal collection than the part used within the library, and inhouse use of current journals is much higher than lentout use.

It was found out that abstracting and indexing journals were title used. Journals in the areas of computer science and management are relatively little used when compared with percentage of collection and percentage of users. Journals in the areas of mathematics and statistics, astronomy and astrophysics and physics are given more use within the library than

journals of other subjects. On the other hand, journals in the areas of science, mechanical engineering and aeronautics, astronautics and spaceflight were borrowed more frequently than journals of other subject groups. The average number of uses per journal is very high in the physics, electronics, science, aeronautics, astronautics and spaceflight groups.

Out of 351 users who borrowed journals during the survey, just 10% were responsible for 38% of total borrowings, and 38% of uses made 74% of total borrowings. Nearly 44% of users borrowed sample journals only once during the three month period. More than half of the users borrowed issues of a single journal/title. Nearly 16% of uses borrowed issues of 4 to 10 journals/titles. Six users borrowed issues of 11 or more journals/titles. More than 60% of users borrowed journals of a single subject group. Three percent of users depended on journals from 4 to 10 different subject groups.

Correlating journal use with various characteristics/parameters of journals such as country of origin, mode of supply, year from which subscribed by ISAC library, periodicity, language paid or free journal, etc., was also planned and will be carried out at a future date. Correlation of use of journals with various user characteristics including user preference in publishing articles and citing articles and use of journals through reprographic service is likewise being taken up as part of a separate study.

REFERENCES AND NOTES

1. Allen Kent et al., Use of Library Materials : the University of Pittsburgh study., New York: Marcel Dekker, Inc., 1979, p 61.
2. University of Pittsburgh, the Senate Library Committee, The Study of Library Use at Pitt by Professor Allen Kent et al: a Pittsburgh reply. University of Pittsburgh, July 1979, p 30.
3. Ibid, p 30.
4. Ibid, p 38.
5. Though the present study is not on comparable grounds with Kent's study, similar data from Kent's study are provided at appropriate places. The use (both inhouse and lentout) per person per trimester is 16.6 for physics, 0.67 for engineering, 2.5 for computer science and 1.7 for mathematics. Hence, Kent concluded that the usage of journals was generally very low. Allen Kent et al. Idem, p 65 and 67.
6. Ibid, p 74.
7. Allen Kent et al., Idem p 69.
8. It may be compared with the average number of uses per year (includes all issues and bound journals unlike the present study) of 33.2 in physics, 9.3 in computer science, 7.2 in mathematics and 4.0 in engineering of Kent's study, Ibid, p 69.
9. Daily issues data for three months subsequently collected revealed that on an average books constituted 80% of daily issues followed by journals with 14.8%. There were 895 issue transactions for journals in the quarter which amounted to an average of 3.7 uses per user. During the period 228 users (or 21% of registered members) borrowed journals at least once.

TABLE 1

Frequency Distribution of Use over Number of Journals

No. of times used	No. of Journals	% of Journals	Cumulative % of Journals	Total use	% of use	Cumulative % of use
00	60	12.4	12.4	00	0.0	0.0
01	15	3.1	15.5	15	0.3	0.3
02	19	3.9	19.4	38	0.7	1.0
03	23	4.7	24.1	69	1.2	2.2
04	21	4.3	28.4	84	1.5	3.7
05	25	5.1	33.5	125	2.3	6.0
06	25	5.1	38.6	150	2.7	8.7
07	23	4.7	43.3	161	2.9	11.6
08	26	5.4	48.7	208	3.7	15.3
09	21	4.3	53.0	189	3.4	18.7
10	19	3.9	56.9	190	3.4	22.1
11	19	3.9	60.8	209	3.7	25.8
12	24	4.9	65.7	288	5.1	30.9
13	21	4.3	70.0	273	4.9	35.8
14	20	4.1	74.1	280	5.0	40.8
15	10	2.1	76.2	150	2.7	43.5
16	5	1.0	77.2	80	1.4	44.9
17	10	2.1	79.3	170	3.0	47.9
18	7	1.4	80.7	126	2.3	50.2
19	11	2.3	83.0	209	3.7	53.9
20	4	0.8	83.8	80	1.4	55.3
21	6	1.2	85.0	126	2.3	57.6
22	4	0.8	85.8	88	1.6	59.2
25	1	0.2	89.7	25	0.4	67.1
26	5	1.0	90.7	150	2.7	69.8
27	5	1.0	91.7	135	2.4	72.2
28	6	1.2	92.9	168	3.0	75.2
29	9	1.9	94.8	261	4.7	79.9
30	5	1.0	95.8	150	2.7	82.6
31	2	0.4	96.2	62	1.1	83.7
32	1	0.2	96.4	32	0.6	84.3
33	4	0.8	97.2	132	2.4	86.7
34	5	1.0	98.2	170	3.0	89.7
35	0	0.0	98.2	0	0.0	89.7
36	2	0.4	98.6	72	1.3	91.0
37	4	0.8	99.4	148	2.6	93.6
38	1	0.2	99.6	38	0.7	94.3
39	0	0.0	99.6	0	0.0	94.3
40	2	0.4	100.0	80	1.4	95.7
41	0	0.0	100.0	0	0.0	95.7
42	1	0.2	100.2	42	0.8	96.5
43	1	0.2	100.4	43	0.8	97.3
44	1	0.2	100.6	44	0.8	98.1
46	1	0.2	100.8	46	0.8	98.8
52	1	0.2	101.0	52	1.0	100.8
58	1	0.2	101.2	58	1.0	100.8
63	1	0.2	101.4	63	1.1	101.9
Error	-	-	-	-104	-1.9	100.0
Total	485	101.4	101.4	5595	100.0	100.0

TABLE II

Frequency Distribution of Inhouse Use over Number of Journals

No. of Inhouse Uses	No. of Journals	% of Journals	Cumulative % of Journals	Total In-house Use	% of In-house Use	Cumulative % of Inhouse Use
00	83	17.1	17.1	00	0.0	0.0
01	6	1.2	18.3	6	0.1	0.1
02	17	3.5	21.8	34	0.8	0.9
03	27	5.6	27.4	81	1.8	2.7
04	28	5.8	33.2	112	2.5	5.2
05	27	5.6	38.8	135	3.0	8.2
06	21	4.3	43.1	126	2.8	11.0
07	21	4.3	47.4	147	3.3	14.3
08	25	5.2	52.6	200	4.5	18.8
09	21	4.3	56.9	189	4.2	23.0
10	23	4.7	61.6	230	5.1	28.1
11	20	4.1	65.7	220	4.9	33.0
12	15	3.1	68.8	180	4.0	37.0
13	16	3.3	72.1	208	4.6	41.6
14	18	3.7	75.8	252	5.6	47.2
15	11	2.3	78.1	165	3.7	50.9
16	9	1.9	80.0	144	3.2	54.1
17	8	1.6	81.6	136	3.0	57.1
18	10	2.1	83.7	180	4.0	61.1
19	6	1.2	84.9	114	2.5	63.6
20	4	0.8	85.7	80	1.8	65.4
21	6	1.2	86.9	126	2.8	68.2
22	7	1.4	88.3	154	3.4	71.6
23	11	2.3	90.6	253	5.7	77.3
24	4	0.8	91.4	96	2.1	79.4
25	5	1.0	92.4	125	2.8	82.2
26	5	1.0	93.4	130	2.9	85.1
27	5	1.0	94.4	135	3.0	88.1
28	2	0.4	94.8	56	1.3	89.4
29	1	0.2	95.0	29	0.6	90.0
30	1	0.2	95.2	30	0.7	90.7
31	3	0.6	95.8	93	2.1	92.8
32	4	0.8	96.6	128	2.9	95.7
33	1	0.2	96.8	33	0.7	96.4
34	2	0.4	97.2	68	1.5	97.9
39	2	0.4	97.6	78	1.7	99.6
40	1	0.2	97.8	40	0.9	100.5
44	1	0.2	98.0	44	1.0	101.5
NA	10	2.1	100.1	-	-	-
Error	-	-	-	- 82	-1.8	99.7
Total	485	100.1	100.1	4475	99.7	99.7

TABLE III

Frequency Distribution of Lentout Use over Number of Journals

No. of Lentout Uses	No. of Journals	% of Journals	Cumulative % of Journals	Total Lentout Use	% of Lentout Use	Cumulative % of Lentout Use
00	211	43.5	43.5	0	0.0	0.0
01	48	10.0	53.5	48	4.3	4.3
02	51	10.5	64.0	102	9.1	13.4
03	38	7.8	71.8	114	10.2	23.6
04	28	5.8	77.6	112	10.2	33.6
05	14	2.9	80.5	70	6.3	39.9
06	11	2.3	82.8	66	5.9	45.8
07	9	1.9	84.7	63	5.6	51.4
08	12	2.5	87.2	96	8.6	60.0
09	8	1.6	88.8	72	6.4	66.4
10	6	1.2	90.0	60	5.4	71.8
11	6	1.2	91.2	60	5.4	77.2
12	6	1.2	92.4	72	6.4	83.6
13	3	0.6	93.0	39	3.5	87.1
14	2	0.4	93.4	28	2.5	89.6
15	3	0.6	94.0	45	4.0	93.6
21	1	0.2	94.2	21	1.9	95.5
22	1	0.2	94.4	22	2.0	97.5
24	1	0.2	94.6	24	2.1	99.6
NA	26	5.4	100.0	00	0.0	99.6
Error	-	-	-	+06	+0.5	100.1
Total	485	100.0	100.0	1120	100.1	100.1

TABLE IV

Subject Use of Journals

Subject Code	Subject	No. of Journals	% of Journals	No. of Users	% of Users	No. of Inhouse Uses	% of Inhouse Uses	No. of Lentout Uses	% of Lentout Uses	Total No. of Uses	% of Total Uses	Av. Quarterly Use for Two Issues
A	Abstract and index journals	26	5.4	*	*	142	3.2	1	0.1	143	2.6	5.5
B	Science (includes biological sciences, chemistry, etc.)	36	7.4	98	27.9	131	8.3	138	12.3	509	9.1	14.1
C	Mathematics and statistics	18	3.7	7	2.0	126	2.8	8	0.7	134	2.4	7.4
D	Astronomy and astrophysics	20	4.1	12	3.4	184	4.1	33	2.9	217	3.9	10.9
E	Physics (includes acoustics, optics, cryogenics, vacuum science and nuclear science)	21	4.3	13	3.7	267	6.0	23	2.1	290	5.2	13.8
F	Enviornment, earth science and remote sensing	28	5.8	25	7.1	276	6.2	39	3.5	315	5.6	11.3
G	Material science	11	2.3	6	1.7	85	1.9	10	0.9	95	1.7	8.6
H	Engineering and technology	18	3.7	34	9.7	143	3.2	41	3.7	184	3.3	10.2
I	Instrumentation	6	1.2	7	2.0	57	1.3	10	0.9	67	1.2	11.2
J	Control engineering	9	1.9	5	1.4	80	1.8	10	0.9	90	1.6	10.0
K	Structural engineering	12	2.5	5	1.4	83	1.9	5	0.4	88	1.6	7.3
L	Thermal engineering	9	1.9	3	0.9	72	1.6	4	0.4	76	1.4	8.4
M	Quality and reliability engineering	5	1.0	3	0.9	27	0.6	10	0.9	37	0.7	7.4
N	Energy and power systems	17	3.5	9	2.6	95	2.1	25	2.2	120	2.1	7.1
O	Mechanical engineering	19	3.9	37	10.5	133	3.0	51	4.6	184	3.3	9.7
P	Electrical engineering and electromagnetism	7	1.4	4	1.1	73	1.6	9	0.8	82	1.5	11.7
Q	Electronics	51	10.5	111	31.6	681	15.2	177	15.8	858	15.3	16.8
R	Communication engineering	26	5.4	34	9.7	228	5.1	54	4.8	282	5.0	10.8
S	Aeronautics, astronautics and spaceflight	43	8.9	69	19.7	482	10.8	171	16.3	653	11.7	15.2
T	Computer science and information theory	65	13.4	76	21.7	504	11.3	173	16.4	677	12.1	10.4
U	Management, behavioural science, industry and economics	22	4.5	35	10.0	154	3.4	52	4.6	206	3.7	9.4
V	Others (includes photography standardisation, safety engineering etc.)	16	3.3	11	3.1	126	2.8	13	1.2	139	2.5	8.7
	Error	0	0.0	0	0.0	+86	+1.9	+63	+5.6	+149	+2.7	-
Total		485	100.0	(351) ¢	-	4475	100.1	1120	100.0	5595	100.2	12.0

* Normally not allowed for borrowing. @ Inhouse use of 4 titles in B, 1 in F, 2 in Q and 3 in U are not available. ¢ As a single user can use journals in more than one group, the total does not tally.

TABLE V

Frequency Distribution of Lentout Use over Number of Users

No. of Lentout Uses	No. of Users	% of Users	Cumulative % of Users	Total Use	% of Use	Cumulative % of Use
01	154	43.9	43.9	155	13.8	13.8
02	67	19.1	63.0	134	12.0	25.8
03	48	13.7	76.7	144	12.9	38.7
04	15	4.3	81.0	60	5.4	44.1
05	17	4.8	85.8	85	7.6	51.7
06	7	2.0	87.8	42	3.8	55.5
07	10	2.8	90.6	70	6.3	61.8
08	10	2.8	93.4	80	7.1	68.9
09	2	0.6	94.0	18	1.6	70.5
10	7	2.0	96.0	70	6.3	76.8
11	6	1.7	97.7	66	5.9	82.7
12	1	0.3	98.0	12	1.1	83.8
13	2	0.6	98.6	26	2.3	86.1
14	0	0.0	98.6	0	0.0	86.1
15	2	0.6	99.2	30	2.7	88.8
16	0	0.0	99.2	0	0.0	88.8
17	1	0.3	99.5	17	1.5	90.3
25	1	0.3	99.8	25	2.2	92.5
86	1 *	0.3	100.1	86	7.7	100.2
Total	351	100.1	100.1	1,120	100.2	100.2

*A high level excutive to whom 43 journals are regularly issued on standing instructions.

TABLE VI

Frequency Distribution of Number of Journals over Number of Users

No. of Journals Used	No. of Users	% of Users	Cumulative % of Users
01	178	50.7	50.7
02	77	21.9	72.6
03	35	10.0	82.6
04	21	6.0	88.6
05	9	2.6	91.2
06	6	1.7	92.9
07	7	2.0	94.9
08	4	1.1	96.0
09	4	1.1	97.1
10	4	1.1	98.2
11	1	0.3	98.5
12	0	0.0	98.5
13	2	0.6	99.1
14	1	0.3	99.4
21	1	0.3	99.7
43	1*	0.3	100.0
Total	351	100.0	100.0

* A high level executive to whom 43 journals are regularly issued on standing instructions.

TABLE VII

Frequency Distribution of Number of Subject Groups in which Journals are Used over Number of Users

No. of Subject Groups in which Journals are Used	No. of Users	% of Users	Cumulative % of Users
01	211	60.1	60.1
02	84	23.9	84.0
03	24	6.8	90.8
04	20	5.7	96.5
05	7	2.0	98.5
06	2	0.6	99.1
07	1	0.3	99.4
08	1	0.3	99.7
09	0	0.0	99.7
10	1*	0.3	100.0
Total	351	100.0	100.0

* A high level executive to whom 43 journals are regularly issued on standing instructions.

DIAGRAM I

CUMULATIVE PERCENTAGE OF JOURNALS Vs CUMULATIVE PERCENTAGE OF USE

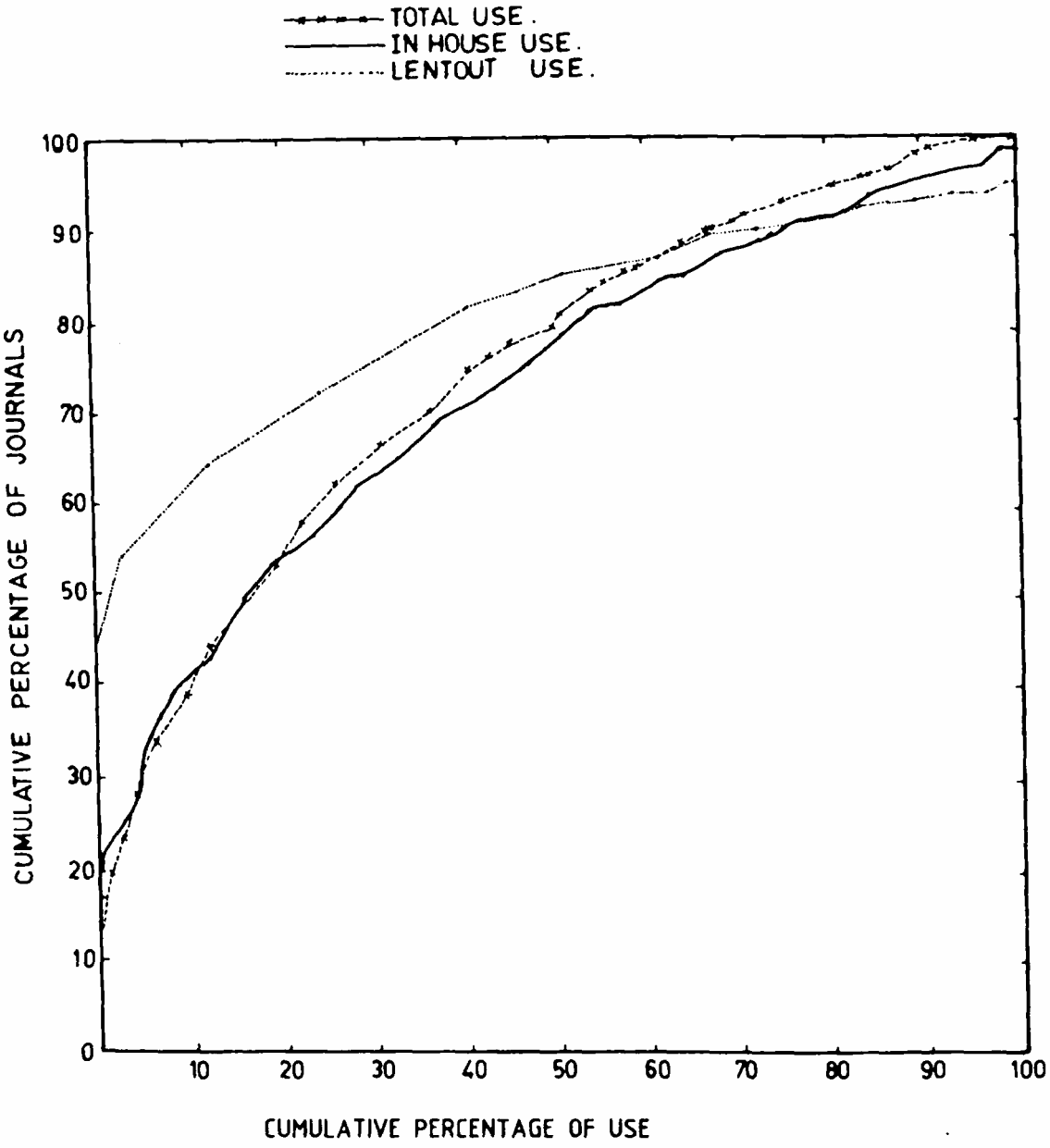
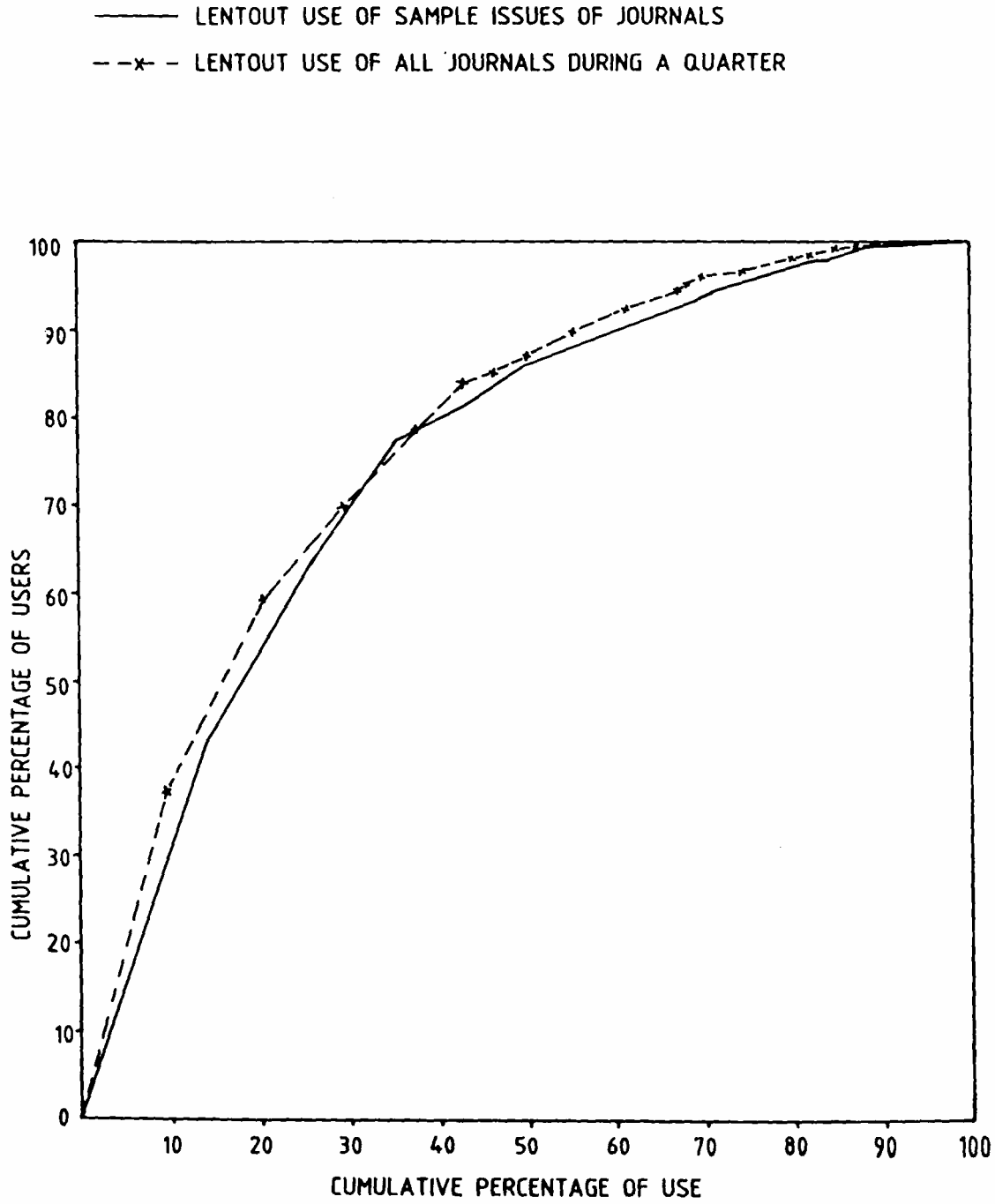


DIAGRAM II

CUMULATIVE PERCENTAGE OF LENTOUT USE Vs CUMULATIVE PERCENTAGE OF USERS OF CURRENT JOURNALS



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* The Serials Librarian 10 (3) Spring 1986: 77-93.

About the Author

Dr. M. S. Sridhar is a post graduate in Mathematics and Business Management and a Doctorate in Library and Information Science. He is in the profession for last 36 years. Since 1978, he is heading the Library and Documentation Division of ISRO Satellite Centre, Bangalore. Earlier he has worked in the libraries of National Aeronautical Laboratory (Bangalore), Indian Institute of Management (Bangalore) and University of Mysore. Dr. Sridhar has published 4 books, 83 research articles, 22 conferences papers, written 19 course materials for BLIS and MLIS, made over 25 seminar presentations and contributed 5 chapters to books.

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